

Potential Effect of Opium Consumption on Controlling Diabetes and Some Cardiovascular Risk Factors in Diabetic Patients

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Original Article

Abstract

Background: Due to this belief that opium may have beneficial effects on diabetes or cardiovascular risk factors, the present study aimed to assess the potential and possible effects of opium consumption on diabetes control and some cardiovascular risk factors in diabetic patients.

Methods: This study enrolled 374 diabetic subjects from diabetes care centers in Kerman, Iran, including opium user group (n = 179) and a non-opium user group (n = 195). The data were collected through a questionnaire completed by interviewing, physical examination and laboratory assessment.

Findings: Opium did not show any statistically significant effect on blood glucose, glycated hemoglobin (HbA1C), fasting blood sugar (FBS), low-density lipoprotein (LDL) and diastolic blood pressure. However, systolic blood pressure (SBP) and prevalence of high SBP were significantly higher in opium user group ($P < 0.050$). In addition, lower serum high-density lipoprotein (HDL) and frequency of lower HDL was significantly higher in opium user group ($P < 0.001$).

Conclusion: According to this study, opium does not seem to have beneficial effects on diabetes control or cardiovascular risk factors. Therefore, it would not be advisable to consume opium as an anti-diabetes or cardioprotective agent.

Keywords: Opium, Diabetes mellitus, Cardiovascular risk factor, Dyslipidemia, Hypertension

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Introduction

Opium dependence is one of the health problems in the Middle East countries including Iran and Afghanistan. In some parts of Iran, the prevalence of dependency is very high. Based on the study of Ziaaddini and Ziaaddini, the prevalence in general population is 5.3% reaching to 22.5% in some rural areas.¹ In Fars province, the prevalence was reported in general population to be 8.8%.² To some extent, the problem comes from the lay belief of many people i.e. opium has therapeutic effects on some metabolic diseases and also related antinociceptive effects as well. Based on some old medicine sources, opium may be an alternative for treatment of chronic diseases such as diabetes, cardiac diseases and hypertension. Sa'di Shirazi, the famous Iranian poets in The Golestan says: "Poison will kill where there is no opium". Therefore, the prevalence is rising in patients with chronic diseases,³⁻⁵ mostly those with less knowledge about the side effects of opium consumption.

Regarding the effect of opium on diabetes and cardiovascular disease (CVD), there is controversies from the reduction in blood glucose and CVD risk factors,^{6,7} no effect on these factors^{8,9} to normal glucose tolerance test in opium users.^{10,11} In contrast. some studies have come to this conclusion that opium facilitates incidence of CVD risk factors.^{12,13} In some cases, reduction in response to insulin against glucose has been reported in opium users.¹⁴⁻¹⁶ Another study has reported increase in hyperglycemia due to discontinuing of opium consumption.¹⁷ Therefore, due to poor knowledge on the effect of opium especially in diabetes control, the present study aimed to investigate the effects of opium in diabetes control and on CVD risk factors. The information provided may help to increase the knowledge of general population about opium effects and probably to be effective in prevention dependency. Furthermore, presenting new functional guides and programs in control of diabetes in diabetic patients consuming opium will be approachable.

Methods

This controlled cross-sectional study was performed on patients referred to Kerman, Iran, diabetes centers after obtaining informed consent.

Participants were 374 subjects including 179 opium addicts and 195 control (non-addicts) subjects. The study was confirmed by the Ethics Committee of Kerman University of Medical Sciences (permission No. 88/110KA). The patients were assured that the information were confidential and used only for research purposes and asked them to disclose any drug consumption. The consumers were subjects who were using opium regularly at least in last three months and the withdrawal signs would appear in them if discontinued opium consumption.

The data were recorded in a questionnaire of demographic characteristics, physical examination and some laboratory tests consisted of serum lipid profile, indices of diabetes control [fasting blood sugar (FBS) and glycated hemoglobin (HbA1C)]. The exclusive criteria were type I diabetes, history of thyroid or renal diseases and taking other alkaloid drugs except opium. The data were analyzed using SPSS for Windows (SPSS Inc., Chicago, IL, USA). Independent t-test, logistic regression and chi-square tests were used for comparison of data between the case and control groups accordingly. P value less than 0.05 was considered as a statistically significant level.

Results

The number of subjects in addicted and non-addicted groups were 179 (47.9%) and 195 (52.1%), respectively. The descriptive characteristics and baseline clinical features of the addicted and non-addicted subjects are presented in table 1. The frequency of male gender and current cigarette smoking were significantly more in the opium user group ($P < 0.001$). Mean age in addicted group (58.2 ± 9.5) was significantly higher than the non-addicted ones (53.5 ± 9.7) ($P < 0.001$). Body mass index (BMI) in the non-addicted group was higher ($P = 0.009$), i.e. the frequency of overweight and obesity in non-addicted group was more than the addicted group. Likewise, mean systolic blood pressure (SBP) was significantly different between the two groups ($P < 0.050$). High-density lipoprotein (HDL) in the addicted group was significantly lower than the non-addicted group ($P < 0.001$), i.e. the frequency of abnormal HDL in the addicted and non-addicted was 69.0% and 44.0%, respectively. There was no statistically significant

difference between the opium and non-opium users in terms of other clinical variables including mean and frequency of high diastolic blood pressure, HbA1c, FBS, cholesterol, triglyceride (TG) and low-density lipoprotein (LDL) (Table 1).

Table 2 shows the effect of opium on biochemical factors analyzed by univariate and multivariate logistic regression tests. In bivariate analysis, except for the low HDL, the effect of opium on other variables was not statistically

significant including systolic and diastolic blood pressure, abnormal cholesterol, LDL, TG, FBS and HbA1c. However, the effect of opium on HDL was still significant with odds ratio of 2.83 ($P < 0.001$). When the association was adjusted for the age, sex, BMI, cigarette smoking, and HbA1C, no statistically significant difference was observed between the two groups except for the HDL that its odds ratio reached to 3.47 (95% CI: 1.89-6.30; $P < 0.001$).

Table 1. Comparison of the baseline characteristics between the opium user and non-user groups

Variables	Addicted group	Non-addicted group	P
Sex (% male)	101 (56.4)	31 (15.9)	< 0.001
Mean age (year)	58.2 ± 9.5	53.5 ± 9.7	< 0.001
Mean BMI (Kg.m ⁻¹)	26.3 ± 5.6	27.7 ± 4.4	0.009
BMI categories (%)			
Normal	70 (41.2)	47 (27.3)	
Overweight	60 (35.3)	72 (41.9)	0.025
Obese	40 (23.5)	53 (30.8)	
Current cigarette smoking (%)	39 (21.8)	6 (3.1)	< 0.001
HbA1c	8.5 ± 1.8	8.5 ± 2.1	0.970
Mean systolic BP	131.2 ± 20.1	125.7 ± 26.4	0.027
Systolic BP (%)	98 (55.4)	95 (50.3)	0.320
Mean diastolic BP	79.9 ± 11.3	79.3 ± 10.9	0.620
Diastolic BP (%)	118 (66.7)	131 (69.3)	0.580
Hypertension	132 (74.6)	141 (74.6)	0.990
Mean FBS	172.1 ± 73.1	177.6 ± 66.1	0.440
Abnormal FBS (%)	118 (67.0)	143 (74.1)	0.137
Mean cholesterol	194.1 ± 49.6	196.9 ± 40.6	0.550
Abnormal cholesterol (%)	73 (42.2)	86 (48.3)	0.250
Mean triglyceride	201.5 ± 157.3	200.1 ± 99.8	0.910
Abnormal triglyceride (%)	101 (58.4)	121 (67.6)	0.073
Mean HDL	38.6 ± 10.9	49.8 ± 12.2	< 0.001
Abnormal HDL (%)	119 (69.6)	75 (44.6)	< 0.001
Mean LDL	117.6 ± 40.7	109.4 ± 34.2	0.052
Abnormal LDL (%)	102 (64.2)	93 (58.1)	0.270

BMI: Body mass index; BP: Blood pressure; FBS: Fasting blood sugar; HDL: High-density lipoprotein; LDL: Low-density lipoprotein

Table 2. Multivariate logistic regression analysis of different factors affected by opium

Variables	Crude analysis			Adjusted analysis*		
	Odds ratio	CI 95%	P	Odds ratio	CI 95%	P
SBP	1.22	0.81-1.85	0.320	1.09	0.63-1.80	0.750
DBP	0.88	0.57-1.37	0.580	1.12	0.62-2.01	0.700
Low HDL	2.83	1.80-4.40	< 0.001	3.47	1.89-6.30	< 0.001
Abnormal LDL	1.28	0.82-2.10	0.270	1.40	0.78-2.50	0.250
Abnormal Cholesterol	0.78	0.51-1.20	0.250	0.86	0.49-1.50	0.610
Abnormal TG	0.67	0.43-1.04	0.074	0.84	0.47-1.50	0.560
Abnormal FBS	0.71	0.45-1.11	0.130	1.58	0.80-3.10	0.180
HbA1c	0.87	0.52-1.45	0.600	1.28	0.69-2.30	0.420

SBP: Systolic blood pressure; DBP: Diastolic blood pressure; TG: Triglyceride; HDL: High-density lipoprotein; LDL: Low-density lipoprotein; FBS: Fasting blood sugar

*Adjusted for age, sex, BMI, cigarette smoking, and HbA1c

Discussion

This study assessed the effect of opium on diabetes control and some cardiovascular risk factors in diabetic patients. High SBP and prevalence of high SBP ($P < 0.050$) and also lower serum HDL and frequency of lower HDL were significantly higher in opium user group ($P < 0.001$). Since HDL is a protective factor against coronary artery disease, this reduction may cause deleterious cardiovascular effects. Angiographic studies on addicted patients have shown severe stenosis in epicardial coronary vessels and presence of atherosclerotic plaques in carotid arteries.^{7,18} Moreover, in animal studies a trend of atheroma plaque formation in carotid artery of opium-addicted hypercholesterolemic rabbits has been reported.¹⁴

Regarding the effects of opium on CVD risk factors, Fatemi et al. reported reduction in total cholesterol.⁶ In contrast, some studies have rejected the effect of opium on lipid profile.⁷⁻⁹ Some studies have reported the effect of opium on serum lipoproteins. Asgary et al. observed reduction in lipoprotein a, Apo-b, fibrinogen, factor 7 and C-reactive protein (CRP).¹¹ Karam et al.¹³ and Mohammadi et al. reported similar results.¹⁴ There are few factors that affect the cholesterol level such as food regimen, malnutrition and physical activity that may be different between addicted and non-addicted subjects, as BMI was significantly less in opium users in the present study. These results were verified in the study of Fatemi et al.⁶ The probable reason may be the impact of medicines, different food regimens and some other difficulties in addicted subjects. Psycho-social problems, reduced appetite, food restrictions after opium consumption, periods of drowsiness and low economy may have had negative effects on calorie intake and leading to weight reduction in these subjects.

In association with diabetes control, blood sugar (BS) and HbA1C were similar in the two groups. There are different reports about the effect of opium on blood glucose. Sadeghian et al. in their study on diabetic rats found no difference in BS.⁸ In contrast, in a cross-sectional study Azod et al. observed a significant reduction in FBS and BS of addicts, though HbA1C was similar in the two groups.⁹ Shirani et al. has also reported a

lower level of HbA1C in opium addicts.⁷ However, Asgary et al.¹¹ and Karam et al.¹³ found a higher level of HbA1C in addicted subjects. The discrepancy in results might be due to differences in sampling or human vs. animal studies. Regarding the of opium effects, various mechanisms have proposed such as increased adrenaline, adrenocorticotrophic hormone (ACTH) and cortisol¹⁹ and glucagon²⁰ that are known as glucose counter regulatory hormones. Based on these results, it seems more studies are needed to clarify the fact.

The results of this study for the effect on blood pressure showed that there was a statistically significant increase in systolic BP in opium user compared to the control group, but in multivariate analysis logistic regression, abnormal SBP was not different ($P = 0.320$). In some previous studies, difference in prevalence of hypertension have been reported between the opium user and non-users.^{7,18} Even passive opium smokings have shown to increase blood pressure of hypercholesterolemic rabbits.²¹ Some studies have mentioned the changes in hormone levels by opium as the reason for these effects.^{19,20}

Nevertheless, more investigations are still needed for clarification of the direct effect of opium on weight, lipid profile, blood glucose and blood pressure. A number of potential limitations of the current investigation have to be considered. First, this study was a cross-sectional study; the correlation of the variable should be interpreted with caution. Second, it should be considered that the existing opium in the community was handmade; consequently it has not identical chemical compounds. A final potential limitation was that self-reporting was not reliable due to the concealment of some of opium user; therefore, it would be better to utilize specific laboratory tests for confirmation of their reporting.

Conclusion

According to this study, opium consumption may have deleterious effect on HDL-c but did not have considerable effects on other lipid profile (TG, cholesterol, LDL-c), blood glucose and blood pressure. Despite lower BMI in opium users, there was higher frequency of disturbances in blood pressure and HDL-c in this group. Therefore, based on the results of this study the belief of some people was not approved about the

protective effect of opium on control of diabetes and other CVD risk factors.

Conflict of Interests

The Authors have no conflict of interest.

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اثر احتمالی مصرف اپیوم بر کنترل دیابت و برخی عوامل خطرزای قلبی - عروقی در بیماران مبتلا به دیابت

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مقاله پژوهشی

چکیده

مقدمه: با توجه به این باور که ممکن است اپیوم اثر سودمندی بر دیابت یا عوامل خطرزای قلبی - عروقی داشته باشد، هدف این مطالعه ارزیابی اثر مصرف اپیوم بر کنترل دیابت و بعضی از این عوامل خطرزا در بین بیماران مبتلا به دیابت بود.

روش‌ها: مطالعه حاضر بر روی ۳۷۴ بیمار مبتلا به دیابت از مراکز دیابت شهر کرمان، شامل مصرف کنندگان اپیوم (۱۷۹ مورد) و گروه غیر مصرف کننده اپیوم (۱۹۵ مورد) انجام شد. اطلاعات از طریق مصاحبه، معاینه فیزیکی و آزمایش‌ها تهیه گردید.

یافته‌ها: اپیوم اثر معنی‌داری را بر قند خون، LDL (Low-density lipoprotein)، FBS (Fasting blood sugar)، HbA1C و فشار خون دیاستولی نشان نداد. هرچند که فشار خون سیستولی و شیوع فراوانی فشار خون بالا در گروه مصرف کننده اپیومی بالاتر بود ($P < 0/05$) و همچنین سطح پایین‌تر HDL (High-density lipoprotein) سرمی و فراوانی پایین‌تر HDL در مصرف کنندگان اپیومی به شکل معنی‌داری بالاتر بود ($P < 0/001$).

نتیجه‌گیری: بر اساس این مطالعه، به نظر نمی‌رسد مصرف اپیوم اثرات سودمندی بر کنترل دیابت و عوامل خطرزای قلبی - عروقی در بیماران مبتلا به دیابت داشته باشد. بنابراین مصرف اپیوم به عنوان یک داروی ضد دیابت یا محافظ قلبی توصیه نمی‌شود.

واژگان کلیدی: اپیوم، دیابت ملیتوس، عوامل خطرزای قلبی - عروقی، اختلالات چربی خون، پرفشاری خون

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